

Applicant: Trinh et al.
Serial No.: 10/632,415
Group Art Unit: 2873

PATENT
Docket No.: 10-9404

AMENDMENTS TO THE SPECIFICATION

Please amend the specification by replacing the following paragraphs. The changes are annotated.

[0004] Some lens prescriptions need sunscreen function for eye protection. A lens can be made into a sunscreen either during or after the manufacturing. Tinting is the most common way to convert a clear lens into a sunscreen at an optical or dispensary laboratory. It is accomplished by immersing the lens in an aqueous dye bath under a given temperature for a certain amount of time. CR-39.RTM. readily absorbs dye molecules. Thus, lenses made from CR-39.RTM. can be easily tinted to achieve different levels of color and darkness. A hard coating is then applied on the tinted lenses by spin- or dip-coating. On the other hand, polycarbonate doesn't absorb dye as easily. Lenses made from polycarbonate rely on a tintable hard coating, which readily absorbs dye molecules, for [it] its tintability.

[0005] The thickness of a tintable hard coating is usually less than about 15 microns. Most tinting dyes can achieve this thickness under normal laboratory tinting conditions. In order to have even color and light transmission, it is desirable to have a coating layer with consistent thickness ~~excess~~ across the lens surface. The quicker the coating tints, the more important the coating's evenness is.

[0056] The optical element holding step is next in the process. Referring to FIG. 1A, an optical element 10 is removed from the coating solution 30 in a coating bath 40. After removal, optical element 10 is held at the position that the bottom edge barely "touches" the surface of the coating solution. The holding time of the preferred embodiment may be from 10 seconds to 5 ~~minute~~ minutes, preferably from 10 seconds to 3 minutes, more preferably from 30 seconds to 120 seconds.

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In the preferred embodiment, the distance from the optical element 10 to the bath 40 is 2 mm, preferably less than 2 mm, more preferably less than 1 mm. As seen in FIG. 1B, a meniscus 20 forms between the optical element 10 and the coating solution 30. The distance from the coating solution to the bottom edge of the optical element is not limited as long as the meniscus holds. The shape and height of the meniscus 20 is determined by the coating properties such as surface tension and viscosity.

[0059] For a thermally curable coating, it is preferred to take the optical elements off the dip-coating line and transfer them into a convection oven to fully cure the coating. The cure of the coating is completed by heat curing at temperatures in the range of 150° F. to 400° F. for a period of from about 5 minutes to 18 hours. The dew point ~~obviously~~ plays an important role for curing a siloxane based coating. Preferably, the dew point is between 40° F. to 80° F.; more preferably between 50° F. to 60° F.

[0068] A thermally curable, tintable coating solution based on a polysiloxane was used to coat some polycarbonate lenses. The coating solution has solid level of 18 to 20% by weight and viscosity from 2.5 to 3.5 cPs. Coating solution was used with temperature from 40 to 50 F. A servomotor was used to control the dipping process. A dip speed of 51 mm/s to 64 mm/s was used. Relative vertical positions between lenses and coating solution were calculated for different lens diameter of 65, 72, 75 and 77 mm. The lenses were held for 1 minute at a position such that the bottoms of the lenses were within 1 mm of the coating solution. The lenses were then pre-cured at 180° F. and 20 minutes to a tack free state, and completely ~~cure~~ cured at 265° F. for 4 hours. There was no noticeable wedge at the bottom of the lens.

[0070] A thermally-cured, tintable coating solution based on a polysiloxane was used to coat some polycarbonate lenses. The coating solution has a solid level of

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18 to 20% and viscosity from 2.5 to 3.5 cPs. Coating solution was used with temperature from 40° F. to 50° F. The coating tank was moved up and down to dip the lenses. A dip speed of 51 mm/s to 64 mm/s was used. After the lenses came out of the coating solution, they were held for 2 seconds, then flipped by a robot so that the convex side of the lenses faced upward, ~~held and held for~~ another 20 seconds until the dripping ~~step~~ stopped. The lenses were then moved in that position into the oven to be pre-cured at 180° F. to a tack free state, and ~~cure~~ cured at 265° F. for 4 hours.

[0071] The ~~resulted~~ resulting lenses had light ~~wedge~~ wedges at the bottom which were about 2 inches wide. ~~This type of wedge~~ Wedges of this type can be used to recognize lenses produced by the dip process on the market.

[0073] A thermally-cured, tintable coating solution based on a polysiloxane was used to coat some polycarbonate lenses. The coating solution has a solid level of 18 to 20% by weight and viscosity from 2.5 to 3.5 cP. The coating solution was used with a temperature from 40°F. to 50°F. The coating tank was moved up and down to dip the lenses. A dip speed of 51 mm/s to 64 mm/s was used. The lenses were moved by a robot. After the coating solution, the lenses were held for 30 seconds until the dripping ~~step~~ stopped. The lenses were then moved in that position into the oven to be pre-cured at 180° F. to a tack free state, and later completely ~~cure~~ cured at 265°F for 4 hours.